

**GOVERNMENT OF ANDHRA PRADESH
ABSTRACT**

Irrigation & Command Area Development Department – APWSIP- NSP – Modernization works – Constitution of four committees, two for the NSP left canal and two for the NSP Right canal to undertake inspection of the Modernization of works to ensure quality – Orders – Issued.

IRRIGATION & CAD (IW.EA) DEPARTMENT

G.O.Rt.No. 1190

Dated:16-12-2013.

Read:

From the Project Director, PPMU, APWSIP, Hyderabad, Lr.No.PD/ PPMU-APWSIP/Hyd/EC/F-284/Vol-1/451 PD,dated:28.03.2013 & 25.10.2013.

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ORDER

In the reference read above, the Project Director, PPMU, Andhra Pradesh Water Sector Improvement Project, has furnished the proposal stating that the World Bank implementation reviews and support mission visited the project works from November 19-30,2012, and desired for constitution of 4 Technical Expert Teams (2 each for left and right bank canal works) to carry out regular field supervision of the canal Rehabilitation/ Modernization works under the project and also to provide technical guidance in the field to ensure that the works are carried out as per the technical guidance in the field, to ensure that the works are carried out as per the technical specifications provided in the Bid Document and that the QC/QA related measures are implemented on ground. As per aide memoir of World Bank, the technical expert team would be headed by a person equivalent to Chief Engineer having experience of the construction of civil works with two other expert members, one having experience in soil and construction material and testing and the other having experience in the design of hydraulic structures. There will be in all 4 Technical expert teams (2 each for the left and right canal works)

2. Under the circumstances reported by the Project Director, PPMU, Andhra Pradesh Water Sector Improvement Project, the Government, after careful consideration of the proposal hereby constitute four technical expert teams (2 each for left and right bank canal works) to carry out regular field supervision of the canal Rehabilitation/ Modernization works under the Nagarjunasagar project and also to provide technical guidance in the field to ensure that the works are carried out as per the technical specifications provided in the Bid Document and that the QC/QA related measures are implemented on ground. The Team Leader/ Construction expert of the committee will be of the cadre of the Chief

P.T.O

Engineer of the Department and the members will be of the cadre of Superintending Engineer, with the following financial implications:-

a. Remuneration and TA/DA

SL No	Designation	Number	Remuneration Per month per Member in Rs	TA/DA Allowance Per Member per month in Rs.	Total per Month per Member in Rs.	Total cost for 4 Members Per annum in Rs.
1.	Team Leader	4	50,000	5,000	55,000	26,40,000
2.	QC/QA Experts	4	40,000	5,000	45,000	21,60,000
3.	Design Expert	4	40,000	5,000	45,000	21,60,000
Total : 69,60,000 say INR 6.96 millions						

- b. One hired vehicle for the entire team will be provided. The cost towards hire charges will be as per Government Circular Memo No. 10783-C/321/DCM-11/2010, Dated:13.06.2012 at the rate of Rs.24,000/- for 2,500 Km's. The annual expenditure on this will be Rs.24,000×12× 4= Rs.11,52,000/-.

Thus the total implication will be Rs.81,12,000/-(69,60,000+11,52,000)

The Chargeable Head of Account is "MJH 4700 Capital outlay on Major Irrigation- 01- Major Irrigation- Commercial – MH 129 Nagarjuna Sagar Project - GH 03 Externally Aided Projects – SH (32) Modernization of Nagarjuna Sagar Canal- 280 Professional Services – 284 Other Payments".

- The ToRs, indicating the scope of the Members , their qualifications etc., are enclosed as Annexure-I, II & III.
- The Project Director, PPMU, Andhra Pradesh Water Sector Improvement Project, Hyderabad, shall take necessary action accordingly.
- This order is issued with the concurrence of Finance (W& P) Department vide their U.O.No.3447/F2(A1)/2013-1, dated:09.11.2013.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

ADITYA NATH DAS
PRINCIPAL SECRETARY TO GOVERNMENT

To
The Project Director, PPMU, APWSIP,
Jalasoudha , Errumanjl, Hyderabad.(w.e)

The Chief Engineer, NSP,
Hill Colony, Nalgonda District.(w.e)

Copy to:

The Finance (W&P) Department(w.e)
The P.S. to Minister (M & MI).(w.e)
The P.S. to Spl. C.S.(w.e)
The P.S. to all Principal Secretaries of the Department(w.e)
SF // SC.

// FORWARDED BY ORDER//

SECTION OFFICER

Terms of Reference for selection of Team Leader/Construction Expert (4 Nos) to carry out regular field supervision of works and also to provide technical guidance in the field works of APWSIP

1. Background:

The development objectives of the Andhra Pradesh Water Sector Improvement Project (APWSIP) will be (i) to improve irrigation service delivery on a sustainable basis to increase productivity of irrigated agriculture in the Nagarjunasagar Scheme command, and (ii) to strengthen the state's institutional capacity for multi-sectoral planning, development and management of its water resources.

The Andhra Pradesh Water Sector Improvement project would support the following four components.

- (a) Component A: Improving irrigation service delivery and management in Nagarjuna Sagar Scheme: This component would support five sub components in Nagarjuna Sagar Scheme which has a command area of about 0.9 million hectares: A1: participatory rehabilitation and modernization of irrigation system, A2: dam safety works, A3: fostering and capacity building of Water Users Organizations, A4: improved water management practices and A5: social and environmental management plan.
- (b) Component B: Agricultural Component: This component would support six sub components in the Nagarjuna Sagar Scheme B1: field crops; B2: horticulture crops; B3: livestock production; B4: fish production; B5: adaptive research and B6: market led extension.
- (c) Component C: Water sector institutional restructuring and capacity building: This component would support six sub components: C1: establishment, operationalization and fostering of Andhra Pradesh Water Resources Regulatory Commission, C2: restructuring and capacity building of Irrigation and Command Area Development, C3: Strengthening and capacity building of Water and Land Management Training Institute, C4: integrated computerized information system, C5 users centered aquifer level ground water management pilot and C6: conjunctive use of surface and ground water pilots in Nagarjuna Sagar Scheme.
- (d) Component D: Project management: This component would support three sub components: D1: project preparation and management unit (PPMU), D2: project monitoring and evaluation, and D3: information, education, and communication program.

2. Objectives of the Consulting Assignment:

The APWSIP supports rehabilitation and modernization works on the 2 main canals, 16 branch canals, 158 major distributaries, lift irrigation schemes, and entire network of distribution system comprising minors / sub-minors as well as the dam safety works on Nagarjunasagar Dam of the Nagarjunasagar Scheme through 24 packages on main canal, 78 packages under Distributory, 672 packages under WUAs and 4 packages consisting 41 LI schemes and about 20 packages for Dam Safety works. These package works shall involve various types of construction procedures, materials, variety of construction techniques with deployment of wide

range of construction equipment. Besides the rehabilitation and modernization of civil works, a large number of Mechanical and electrical components pertaining to gates and the associated hoisting arrangements, pumps and motors in pumping stations are also required to be rehabilitated adopting latest technological trends and even replaced with new ones wherever so required.

Accordingly Government of Andhra Pradesh (GoAP) has engaged three consulting agencies a) Consultancy for Engineering designs to ensure timely guidance and supply of Engineering Designs b) Third party Quality Control and Quality Assurance consultancy to achieve requisite quality of construction on the APWSIP works and c) Monitoring and Evaluation of progress of works. It is proposed to engage the technical team of experts two each for the left and right bank canal works which will have the following composition with three members in each team namely Construction Expert (Team Leader), QC/QA Expert and Design Expert. As a part of forming 4 technical team of experts, it is proposed to select 4nos of QC/QA Experts.

Presently the project having taken off in 2008 under retroactive funding has come into force from August, 2010 and now is due for First Mid term visit of the World Bank. The package works numbering 24 on Main and Branch Canals, 78 on Distributaries are awarded and are at various stages of progress. The main and branch canal packages are due for completion ranging from 2013 to 2015. Similarly the DC-packages are also targeted for completion by 2015.

WUA packages numbering to 672 are at estimate stage and planned for award before December, 2013. The team leader/Construction expert has to carry out regular field supervision of the canal rehabilitation/modernization works under the project and also to provide technical guidance in the field to ensure that the works are carried out as per the technical specifications provided in the agreement and that the Quality Control/Quality Assurances of Civil works and regular field supervision of the canal apart from the 3rd party QC/QA Consultancy.

3. Duration of Consultancy:

Initially the **team leader/construction expert** of technical expert team will be appointed for a period of one year and will be extended for a period of two or more years based on performance on mutually agreeable terms & conditions, if required.

4. Scope of services:

- a) The Individual consultant i.e Team leader/construction expert has to work in tandem with the Design experts and Quality Control Experts who will be appointed by the PPMU. The overall responsibility of achieving desired goals lies with the Team leader only.
- b) To carry out regular field supervision of works to ensure proper quality, correct technical specifications and construction procedures followed on various items of work as stipulated in the QC manual and agreement.

- c) To provide technical guidance in the field to achieve quality work as per the Technical Specifications provided in the agreement and related measures of QC & QA.
- d) To appraise regularly the Chief Engineer, NSP and the Project Director, PPMU of the progress of work on various items under different packages and their quality.
- e) Team Leader/Construction expert shall carry out regular visits to work site to provide technical guidance to the engineers to ensure that the works are carried out as per technical specifications in the agreement (cleared with the Bank & Project Director, PPMU) and that the Quality Control & Quality Assurance related measures are implemented on ground.
- f) Shall inspect all the earthwork excavation and embankment works, sub grade preparation for lining, CNS treatment, lining works, laying of filters, provision of construction, contraction and expansion joints in the lining.
- g) Shall act as a perfect link between field functionaries and Project Director, PPMU so that the Project Director will be able to visualize as what is happening in the field exactly and whether the works are going on, meticulously following technical specifications and drawings.
- h) Shall verify the drawings of canal sections, structures, lining, shot-creting, Embankment works including Earthwork Excavation, Mechanical works and to see that the works are carried out as per approved drawings and technical specifications.
- i) Shall, during field visit to works, carry out supervision of quality control tests being conducted by the Agencies/ Project Engineers, Departmental QC staff and 3rd party QC consultancy personnel. He shall get the representative tests conducted in his presence.
- j) Shall peruse OK cards during his field visits and ensure that these are properly filled and maintained. Any deficiency observed in the work in progress shall be mentioned by him in the concerned OK card for rectification. He shall also provide technical guidance, wherever so needed.
- k) In the case of any deficient/substandard work observed during inspection or brought to the notice of the team leader, such works should be stopped forth with and further work should not be allowed to be carried out till the defect is rectified. Such events should immediately be brought to the notice of the Chief Engineer, NSP and the Project Director, PPMU. The Expert team should suggest necessary remedial measure to address the observed deficiencies and improve the construction quality of works.

- l) The team leader/Construction expert shall be reporting to the Chief Engineer, NSP and Project Director, PPMU of their duties and lend hand holding support to the Chief Engineer and Field Engineers of NSP.
- m) The team leader should coordinate his work with project engineers, Agency and TPQC.
- n) The team leader/Construction expert should appraise the Chief Engineer, NSP and the Project Director of PPMU of construction activity of all ongoing package works through
 - i) Daily inspection notes directly sent through E-mail
 - ii) Weekly progress reports clearly highlighting whether
 - a) The technical specifications, construction procedures and QC aspects in respect of various types of works viz., earth work, CC lining, CM & CD works, shot-creting and mechanical works etc, are in accordance with Bid Document /Approved drawings and QC guide lines.
 - b) QC tests conducted on various items of works by the Agency, Department and TPQC are as per norms prescribed and within the threshold limits and suggestions made to bring back the deficient works to desired quality shall be reported.
 - iii) In the case of any deficient/substandard works observed during inspection the matter should be immediately brought to the notice of the Chief Engineer, NSP and the Project Director, PPMU through SMS/E-mail followed by a special report clearly highlighting nature of deficiencies observed and remedial measures suggested to address the observed deficiencies to improve the construction quality of works. The team leader should also visit such sites again after defects are rectified to ascertain if proper quality is restored.
- o) The team leader/Construction expert shall reside at the respective circle head quarters and frequently inspect the works.

5. Qualification and experience of the Team leader/Construction expert:

He should be at least a graduate Civil Engineer. Preference will be given to the Post Graduate in Water Resources Engineering / Structures. He should have a knowledge of AutoCAD. He should have Managerial and Administrative skills coupled with comprehensive knowledge, documentation and presentation skills. He should have at least 5 years experience in design of Major Water Resources Project, involving design of Dam and Canal system. He should possess minimum 15 years of experience in Project Management and construction of field works like

construction of Dams, excavation of Canals, lining of canals, construction of CM-CD works etc., Experience in Rehabilitation and Modernization of Irrigation projects will be preferable. The cadre expected is Chief Engineer of Irrigation Department or equivalent cadre from any reputed construction firm.

6. **Facilities provided:** Office accommodation will be provided by the Client. Combined transport facility will be provided.

ADITYA NATH DAS
PRINCIPAL SECRETARY TO GOVERNMENT

Terms of Reference for selection of QC&QA Experts (4 Nos) to carry out regular field supervision of works and also to provide technical guidance in the field works of APWSIP

1. Background:

The development objectives of the Andhra Pradesh Water Sector Improvement Project (APWSIP) will be (i) to improve irrigation service delivery on a sustainable basis to increase productivity of irrigated agriculture in the Nagarjunasagar Scheme command, and (ii) to strengthen the state's institutional capacity for multi-sectoral planning, development and management of its water resources.

The Andhra Pradesh Water Sector Improvement project would support the following four components.

- (a) Component A: Improving irrigation service delivery and management in Nagarjuna Sagar Scheme: This component would support five sub components in Nagarjuna Sagar Scheme which has a command area of about 0.9 million hectares: A1: participatory rehabilitation and modernization of irrigation system, A2: dam safety works, A3: fostering and capacity building of Water Users Organizations, A4: improved water management practices and A5: social and environmental management plan.
- (b) Component B: Agricultural Component: This component would support six sub components in the Nagarjuna Sagar Scheme B1: field crops; B2: horticulture crops; B3: livestock production; B4: fish production; B5: adaptive research and B6: market led extension.
- (c) Component C: Water sector institutional restructuring and capacity building: This component would support six sub components: C1: establishment, operationalization and fostering of Andhra Pradesh Water Resources Regulatory Commission, C2: restructuring and capacity building of Irrigation and Command Area Development, C3: Strengthening and capacity building of Water and Land Management Training Institute, C4: integrated computerized information system, C5 users centered aquifer level ground water management pilot and C6: conjunctive use of surface and ground water pilots in Nagarjuna Sagar Scheme.
- (d) Component D: Project management: This component would support three sub components: D1: project preparation and management unit (PPMU), D2: project monitoring and evaluation, and D3: information, education, and communication program.

2. Objectives of the Consulting Assignment:

The APWSIP supports rehabilitation and modernization works on the 2 main canals, 16 branch canals, 158 major distributaries, lift irrigation schemes, and entire network of distribution system comprising minors / sub-minors as well as the dam safety works on Nagarjunasagar Dam of the Nagarjunasagar Scheme through 24 packages on main canal, 78 packages under Distributory, 672 packages under WUAs and 4 packages consisting 41 LI schemes and about 20 packages for Dam Safety works. These

package works shall involve various types of construction procedures, materials, variety of construction techniques with deployment of wide range of construction equipment. Besides the rehabilitation and modernization of civil works, a large number of Mechanical and electrical components pertaining to gates and the associated hoisting arrangements, pumps and motors in pumping stations are also required to be rehabilitated adopting latest technological trends and even replaced with new ones wherever so required.

Accordingly Government of Andhra Pradesh (GoAP) has engaged three consulting agencies a) Consultancy for Engineering designs to ensure timely guidance and supply of Engineering Designs b) Third party Quality Control and Quality Assurance consultancy to achieve requisite quality of construction on the APWSIP works and c) Monitoring and Evaluation of progress of works. It is proposed to engage the technical team of experts two each for the left and right bank canal works which will have the following composition with three members in each team namely Construction Expert (Team Leader), QC/QA Expert and Design Expert. As a part of forming 4 technical team of experts, it is proposed to select 4no's QC/QA Experts.

Presently the project having taken off in 2008 under retroactive funding has come into force from August, 2010 and now is due for First Mid term visit of the World Bank. The package works numbering 24 on Main and Branch Canals, 78 on Distributaries are awarded and are at various stages of progress. The main and branch canal packages are due for completion ranging from 2013 to 2015. Similarly the DC-packages are also targeted for completion by 2015. WUA packages numbering to 672 are at estimate stage and planned for award before December, 2013. The QC & QA experts are to carry out regular field supervision of the canal rehabilitation/ modernization works under the project and also to provide technical guidance in the field to ensure that the works are carried out as per the technical specifications provided in the agreement and that the Quality Control/Quality Assurances of Civil works.

3. Duration of Consultancy:

Initially QC&QA Expert will be appointed for a period of one year and will be extended for a period of two or more years based on performance on mutually agreeable terms & conditions, if required.

4. Scope of services:

- a) The Individual consultant i.e Quality Control Expert has to work in tandem with the Team leader and Design experts who will be appointed by the PPMU.
- b) To carry out regular field supervision of works to ensure proper quality, correct technical specifications and construction procedures followed on various items of work as stipulated in the QC manual and agreement.
- c) To provide technical guidance in the field to achieve quality work as per the Technical Specifications provided in the agreement and related measures of QC & QA.

- d) To appraise regularly the Chief Engineer, NSP and the Project Director, PPMU of the progress of work on various items under different packages and their quality.
- e) QC & QA Expert shall carry out regular visits to work site to provide technical guidance to the engineers to ensure that the works are carried out as per technical specifications in the agreement (cleared with the Bank & Project Director, PPMU) and that the Quality Control & Quality Assurance related measures are implemented on ground.
- f) Shall inspect all the earthwork excavation and embankment works, sub grade preparation for lining, CNS treatment, lining works, laying of filters, provision of construction, contraction and expansion joints in the lining.
- g) Shall act as a perfect link between field functionaries and Project Director, PPMU so that the Project Director will be able to visualize as what is happening in the field exactly and whether the works are going on, meticulously following technical specifications and drawings.
- h) Shall verify the drawings of canal sections, structures, lining, shot-creting, Embankment works including Earthwork Excavation, Mechanical works and to see that the works are carried out as per approved drawings and technical specifications.
- i) Shall, during field visit to works, carry out supervision of quality control tests being conducted by the Agencies/ Project Engineers, Departmental QC staff and 3rd party QC consultancy personnel. He shall get the representative tests conducted in his presence.
- j) Shall peruse OK cards during his field visits and ensure that these are properly filled and maintained. Any deficiency observed in the work in progress shall be mentioned by him in the concerned OK card for rectification. He shall also provide technical guidance, wherever so needed.
- k) In the case of any deficient/substandard work observed during inspection or brought to the notice of the expert, such works should be stopped forth with and further work should not be allowed to be carried out till the defect is rectified. Such events should immediately be brought to the notice of the Chief Engineer, NSP and the Project Director, PPMU. The Expert should suggest necessary remedial measure to address the observed deficiencies and improve the construction quality of works.
- l) The expert team shall be reporting to the Chief Engineer, NSP and Project Director, PPMU and lend hand holding support to the Chief Engineer and Field Engineers of NSP.

- m) The expert should coordinate their work with project engineers, Agency and Third Party Quality Control and Quality Assurance.
- n) The expert should appraise the Chief Engineer, NSP and the Project Director of PPMU of construction activity of all ongoing package works through
 - i) Daily inspection notes directly sent through E-mail
 - ii) Weekly progress reports clearly highlighting whether
 - a) The technical specifications, construction procedures and QC aspects in respect of various types of works viz., earth work, CC lining, CM & CD works, shot-creting and mechanical works etc, are in accordance with Bid Document /Approved drawings and QC guide lines.
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 - iii) In the case of any deficient/substandard works observed during inspection the matter should be immediately brought to the notice of the Chief Engineer, NSP and the Project Director, PPMU through SMS/E-mail followed by a special report clearly highlighting nature of deficiencies observed and remedial measures suggested to address the observed deficiencies to improve the construction quality of works. The expert team should also visit such sites again after defects are rectified to ascertain if proper quality is restored.
- o) The expert shall reside at the respective circle head quarters and frequently inspect the works.

5. Qualification and experience of the Q.C. Expert:

He should be a graduate in Civil Engineering and possess about 15 years experience in Q.C/Q.A of civil works with good knowledge of Indian Standards and working knowledge on computers. Construction experience in any Major Irrigation Project / Multipurpose river valley project is preferable. He should have a thorough knowledge of various Q.C. tests to be done for all input material during preconstruction stage, construction stage and post construction stage. He should be familiar with the QC testing procedures, calibration of QC equipment, field Q.C. laboratories and mobile testing laboratories. The cadre expected will be Superintending Engineer of Irrigation Department or equivalent in any reputed construction firm or any reputed Quality Control testing laboratories. Post Graduation in relevant is preferable.

6. **Facilities provided:** Office accommodation will be provided by the Client. Combined transport will be provided for field visits.

ADITYA NATH DAS
PRINCIPAL SECRETARY TO GOVERNMENT

Terms of Reference for selection of Design Expert (4 Nos) to carry out regular field supervision of works and also to provide technical guidance in the field works of APWSIP

Background:

The development objectives of the Andhra Pradesh Water Sector Improvement Project (APWSIP) will be (i) to improve irrigation service delivery on a sustainable basis to increase productivity of irrigated agriculture in the Nagarjunasagar Scheme command, and (ii) to strengthen the state's institutional capacity for multi-sectoral planning, development and management of its water resources.

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- (d) Component D: Project management: This component would support three sub components: D1: project preparation and management unit (PPMU), D2: project monitoring and evaluation, and D3: information, education, and communication program.

1. Objectives of the Consulting Assignment:

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Presently the project having taken off in 2008 under retroactive funding has come into force from August, 2010 and now is due for First Mid term visit of the World Bank. The package works numbering 24 on Main and Branch Canals, 78 on Distributaries are awarded and are at various stages of progress. The main and branch canal packages are due for completion ranging from 2013 to 2015. Similarly the DC-packages are also targeted for completion by 2015. WUA packages numbering to 672 are at estimate stage and planned for award before December, 2013. The Design experts are to carry out regular field supervision of the canal rehabilitation/modernization works under the project and also to provide technical guidance in the field to ensure that the works are carried out as per the technical specifications provided in the agreement and drawings.

2. Duration of Consultancy:

Initially **Design expert** will be appointed for a period of one year and will be extended for a period of two or more years based on their performance on mutually agreeable terms & conditions, if required.

3. Scope of services:

- a) The Individual consultant i.e Design experts has to work in tandem with the Team leader and Quality Control Expert who will be appointed by the PPMU.
- b) To carry out regular field supervision of works to ensure that the works are executed as per drawings, technical specifications and construction procedures.
- c) To study the drawings and lend hand on support to executing Agencies and field staff to achieve quality work as per the Technical Specifications provided in the agreement and related measures of QC & QA.

- d) To appraise regularly the Chief Engineer NSP and the Project Director, PPMU of the progress of work on various items under different packages and their quality.
- e) Shall inspect all the earthwork excavation and embankment works, sub grade preparation for lining, CNS treatment, lining works, laying of filters, provision of construction, contraction and expansion joints in the lining.
- f) Shall act as a perfect link between field functionaries and Project Director, PPMU so that the Project Director will be able to visualize as what is happening in the field exactly and whether the works are going on, meticulously following technical specifications and drawings and guide the field functionaries to execute the works as per design and drawings.
- g) Shall verify the drawings of canal sections, structures, lining, shot-creting, Embankment works including Earthwork Excavation, Mechanical works and to see that the works are carried out as per approved drawings and technical specifications.
- h) In the case of any deficient/substandard work observed during inspection or brought to the notice of the expert, such works should be stopped forth with and further work should not be allowed to be carried out till the defect is rectified. Such events should immediately be brought to the notice of the Chief Engineer, NSP and the Project Director, PPMU. The Expert team should suggest necessary remedial measure to address the observed deficiencies and improve the construction quality of works.
- i) Shall, during field visit to works, carry out supervision of quality control tests being conducted by the Agencies/ Project Engineers, Departmental QC staff and 3rd party QC consultancy personnel. He shall get the representative tests conducted in his presence.
- j) Shall peruse OK cards during his field visits and ensure that these are properly filled and maintained. Any deficiency observed in the work in progress shall be mentioned by him in the concerned OK card for rectification. He shall also provide technical guidance, wherever so needed.
- k) The technical expert team should appraise the Chief Engineer, NSP and the Project Director of PPMU of construction activity of all ongoing package works through
 - i) Daily inspection notes directly sent through E-mail
 - ii) Weekly progress reports clearly highlighting whether
 - a) The technical specifications, construction procedures in respect of various types of works viz., earth work, CC lining, CM & CD works, shot-creting and mechanical works etc, are in accordance with Bid Document /Approved drawings.

- iii) In the case of any deficient/substandard works observed during inspection the matter should be immediately brought to the notice of the Chief Engineer, NSP and the Project Director, PPMU through SMS/E-mail followed by a special report clearly highlighting nature of deficiencies observed and remedial measures suggested to address the observed deficiencies to improve the construction quality of works. The expert should also visit such sites again after defects are rectified to ascertain if proper quality is restored.
- 1) The expert shall reside at the respective circle head quarters and frequently inspect the works.

4. Qualification and experience of the Design. Expert:

He should be at least graduate in civil engineering with computer working knowledge and possess minimum 10 to 15 years experience in design of Major irrigation projects involving design of canal systems and Dam system. Construction experience in Major Water Resources Project is essential. Post Graduation in structures will be preferable. The cadre expected is Superintending Engineer of Irrigation Department or equivalent from any reputed construction firms or any reputed design consultancy firm.

- 5. **Facilities provided:** Office accommodation will be provided by the Client. Combined transport facility will be provided for site visit.

**ADITYA NATH DAS
PRINCIPAL SECRETARY TO GOVERNMENT**